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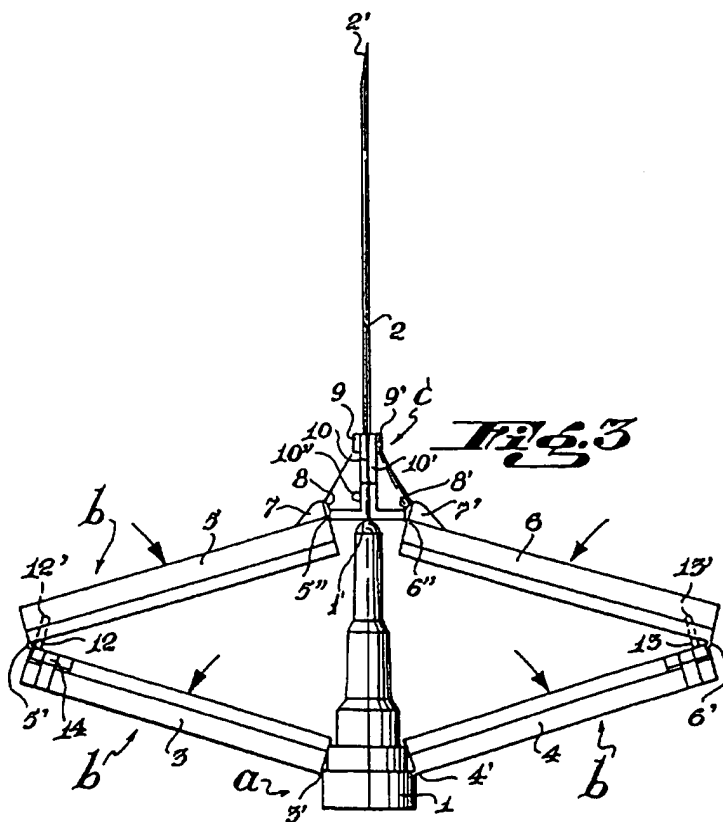
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EP 0321903 A2 US 5151089 A US 4923446 A
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(54) Needle protector

(57) A protector for a needle comprising means (a) for retaining a needle (2) and a protective device (3, 4, 5, 6) connected to the retaining means which can be moved between a stowed position and a deployed position in which it can shield the end of the needle. The protective device is a deformable parallelogram which is resiliently biased from its out-of-use position to its extended protective position. The device has locking means which retain it in either position.



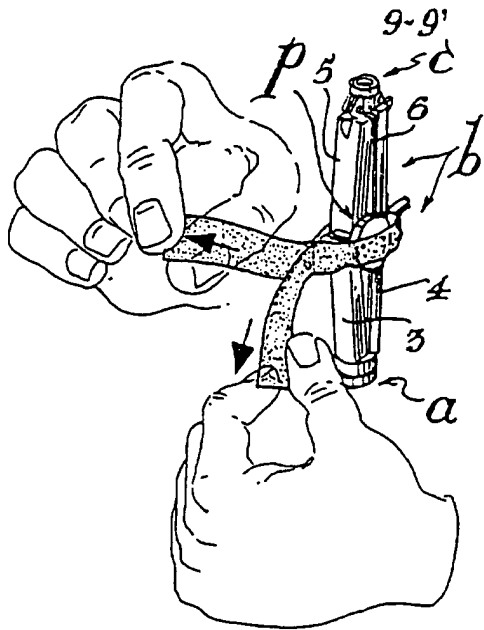


Fig. 1

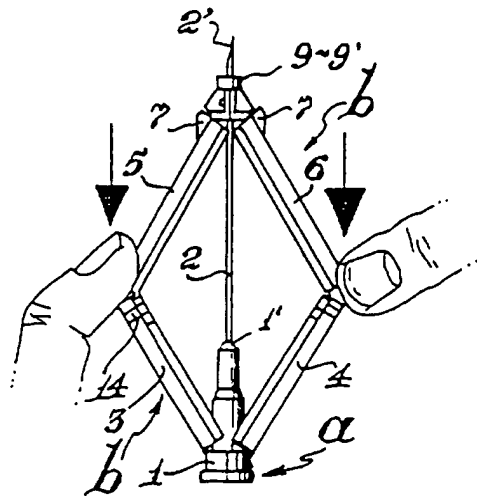


Fig. 2

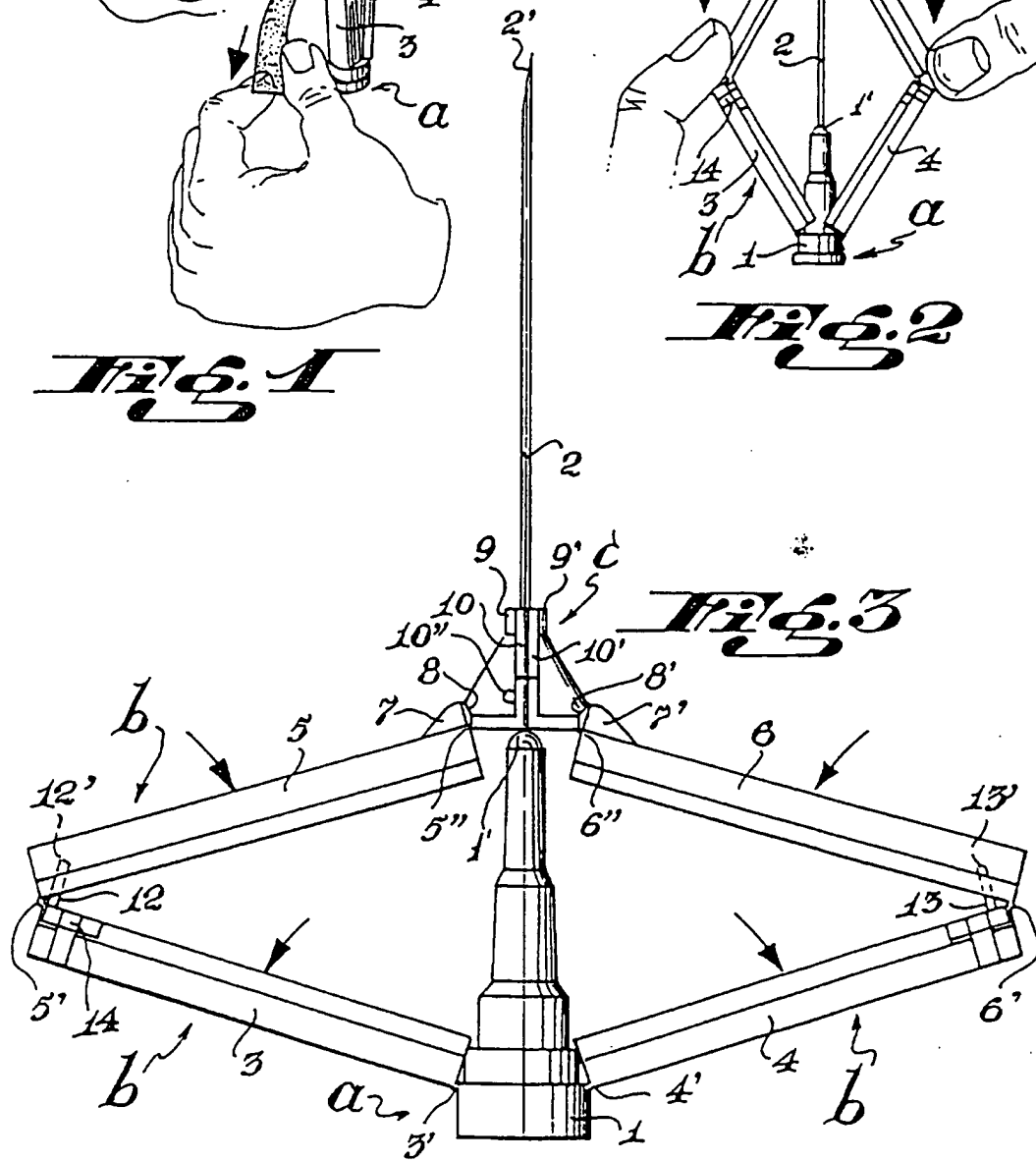
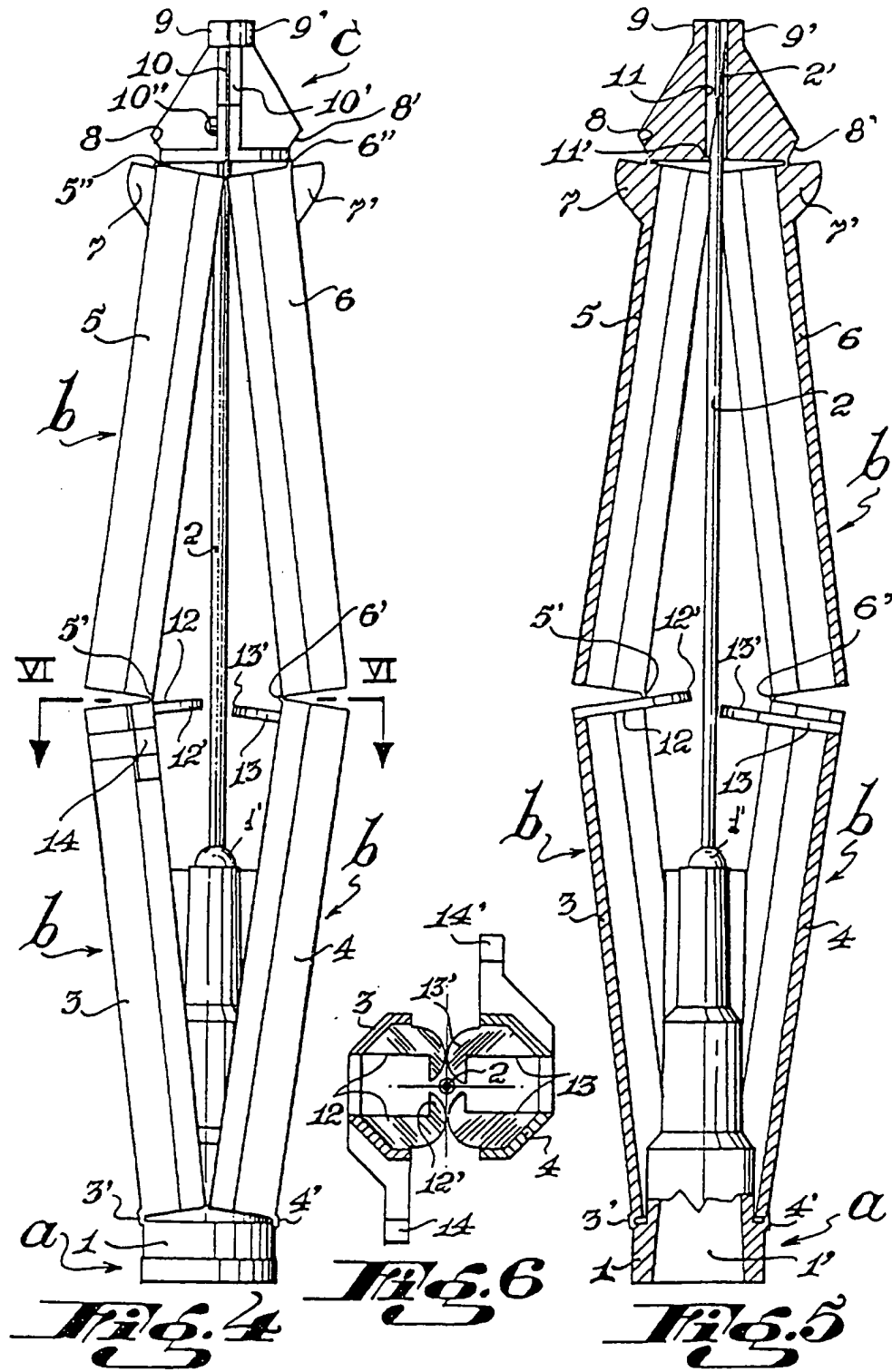
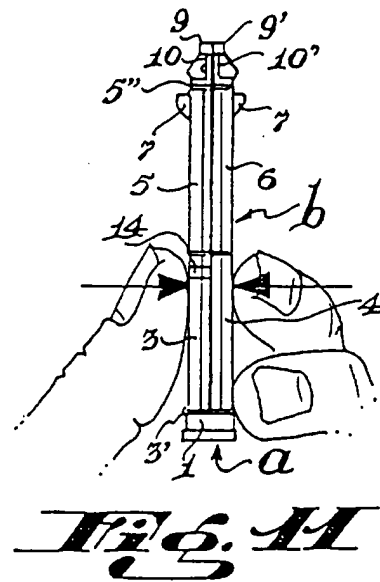
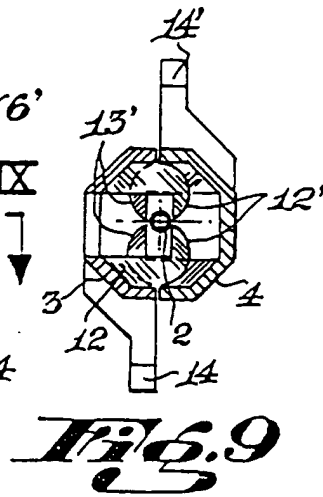
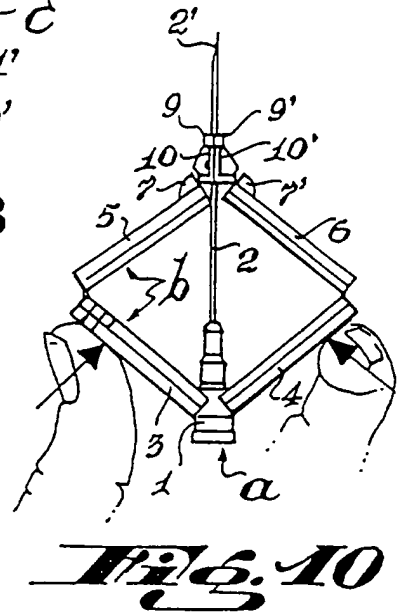
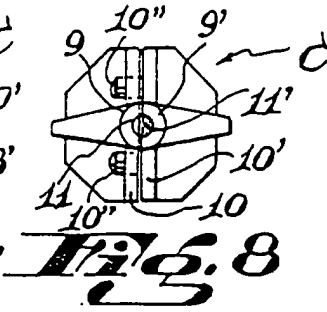
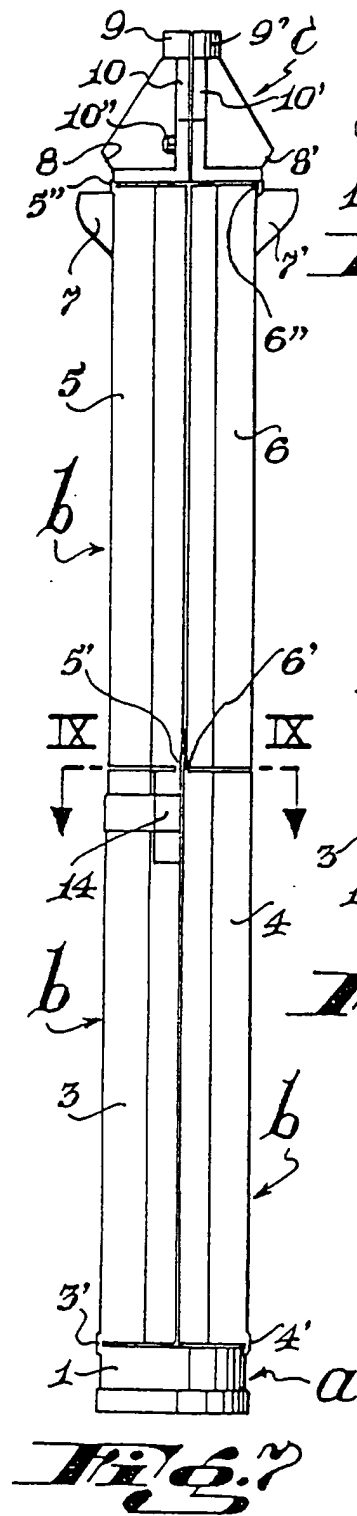


Fig. 3





A PROTECTOR FOR A NEEDLE

The present invention relates to a protector for a needle and more particularly to a pliable security protector for syringe needles in general which provides a practical and
5 secure means destined to the covering of said needles.

As is already known, in the handling of syringes (for the application of injections, blood extraction, etc.), needles constitute the paramount risk factor, as it is a cutting and stabbing means which can be easily introduced in the body due to its size and
10 shape, even through involuntary actions.

The problem deepens even more when the needle has been already used, in case of accidental pinching or cutting, if it was contaminated – for example as a consequence of having been used by a person with hepatitis, AIDS, etc. The wound produced
15 unfortunately constitutes the best way for the transmission of the illness through the blood.

Removable tip protectors are known. These are destined to cover the needle against accidents, when it is handled before or after having been used.

20 Although it is true that said tip protectors comply to their objective of covering the needle, given that they are applied simply through pressure, it is common that the needle and protector uncouple –due to incorrect collocation, defective fitting, or simply as a consequence of the handling they are submitted to – which, through time,
25 has caused numerous accidents.

The present invention seeks to solve these and other problems, and preferably consists of a pliable protector, which is normally found in a position of complete covering of the needle, while as it is folded said needle is easily enabled; the removing of the
30 locking means is sufficient to cause its automatic coverage due to the elasticity of the articulations.

Such a device has the advantage of forming a single piece with the coupling base of the needle in such a way that there is no possibility that the coverage might loosen or get lost, at the same time it does not require to fit in or enter in contact with the needle for its command, since the same is done with one hand, with no risk
5 whatsoever for the operator.

Finally, it must be noted that the new covering device does not imply a modification of the shape nor the size of the conventional coupling nozzles of the syringe, neither the type or size of the needle.

10 The acceptance that this invention will have when put into practice can be easily imagined, whatever the category or destination it is given, as, due to the characteristics that define it, it can be applied to any type of needle and be usable in any type of syringe.

15 According to a first aspect of the present invention this is provided a protector for a needle comprising means for retaining a needle and a protective device connected to the retaining means which can be moved between a stowed position and a deployed position in which it can shield the end of the needle.

20 According to a second aspect of the present invention, there is provided a protector for a needle comprising a long tip protector (b) which, surpassing the length of the needle (2), covers the needle completely, the needle (2) being housed in a nozzle (a) coupled with the spout of a syringe, wherein said tip protector (b) comprises a
25 deformable parallelogram of four concave arms (3), (5), (4), (6), two pairs of arms being articulated at one of their ends (5'), (6') to form two composed long arms; each of these composed long arms having one end (3'), (4') coupled in an articulate way with the coupling nozzle (a) in which the needle (2) is housed, while, on the opposite end, the same arms articulate with a tubular terminal (9-9'), said tubular terminal
30 being disposed surpassing the sharp pointed end (2') of the needle (2) and constituting an enabling passage for the folding of the arms (5) and (6) of the deformable parallelogram against its base in the mentioned coupling nozzle (a), said cover

including temporal positional locking means (1') for this folded disposition, and locking means (p) for the concave arms (5)-(3), (6)-(4) when deployed in a covering disposition of the needle (2).

5 Preferred features of the present invention will now be described, purely by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a view in perspective of the protector for a needle according to a preferred embodiment of the present invention and including a contact clamp, showing the way in which it is opened to be used.

10 Figure 2 is an elevational view of the protector for a needle consisting in parts in the shape of a deformable parallelogram, indicating the way in which the folding is produced, according to the arrows, to the effect of giving place to the correlative projection of the needle.

Figure 3 is another elevational view of the folded protector for a needle with the needle completely enabled, permitting the view of its general constitution and disposition of the different parts and elements that constitute it.

Figure 4 is another elevational view of the protector for a needle in a position indicating the way in which it covers it completely.

Figure 5 is a longitudinal section of the needle with its protector as shown in Figure 4, that shows the profile of the simple and composed arms which constitute it.

Figure 6 is a cross-sectional view along lines VI-VI in Figure 4, showing the way in which the intermediate internal projections of the arms define between each other an adjusted passage of the needle, preventing relative movements or flexions of the same when it is covered by the protector.

25 Figure 7 is an elevational view of the closed protector for a needle, completely covering the needle.

Figure 8 is a top view of the closed protector, in which the extreme nozzle can be seen -formed by two complementary semi-nozzles- through which the needle projects.

30 Figure 9 is a cross sectional view along lines IX-IX in Figure 7.

Figure 10 shows how the open protector begins operating to produce its shutting, according to the arrows, actioning it with only one hand and without danger

of entering in contact with the needle; and

Figure 11 is the complementary view to that of Figure 10 in which it is shown how the tip protectors finish closing through pressure of the composed arms, according to the arrows and the corresponding positional lock.

5 In the different figures, the same reference numbers indicate the same parts or corresponding ones, the group of various elements having been marked with letters.

Said references correspond to the following detail, being:

- | | | |
|----|-------|--|
| | (a) | - nozzle |
| | (b) | - long tip protector |
| 10 | (c) | - tubular head |
| | (p) | - binding |
| | (1) | - body of (a) |
| | (1') | - locking end of (b) |
| | (2) | - needle |
| 15 | (2') | - sharp pointed end |
| | (3) | - first elementary arm (base) |
| | (3') | - base articulation of the first composed arm |
| | (4) | - second elementary arm (base) |
| | (4') | - base articulation of the second composed arm |
| 20 | (5) | - third elementary arm (end) |
| | (5') | - intermediate articulation of the first composed arm |
| | (5'') | - head articulation of the first composed arm |
| | (6) | - fourth elementary arm (end) |
| | (6') | - intermediate articulation of the second composed arm |
| 25 | (6'') | - head articulation of the second composed arm |
| | (3-5) | - first composed arm |
| | (4-6) | - second composed arm |
| | (7) | - holder of (3-5) |
| | (7') | - holder of (4-6) |
| 30 | (8) | - part of the head body related to (5) |
| | (8') | - part of the head body related to (6) |
| | (9) | - semi-nozzle of (c) corresponding to (8) |

- (9') - semi-nozzle of (c) corresponding to (8')
- (10) - nerve of (8)
- (10') - nerve of (8')
- (10'') - locking round projection of folding
- 5 (11) - passage of the needle
- (11') - elastic membrane of positional lock in (11)
- (12) - internal centering fin of (3-5)
- (12') - terminal of (12)
- (13) - internal centering fin of (4-6)
- 10 (13') - terminal of (13)
- (14) - intermediate holder
- (14') - intermediate holder

With reference to the accompanying drawings, the protector for a needle (b) according
15 to a preferred embodiment of the present invention, for syringe needles (2), consists
of a long tip protector which, surpassing the length of the needle (2), covers it
completely, said needle having its beginning in a nozzle (a) coupled to the syringe
(not illustrated), while at the opposite end terminates with a sharp pointed end (2').

20 More particularly, and as can be seen in the Figures, the long tip protector (b) consists
of four elementary arms (3), (4), (5) and (6), respectively, with an internal
complementary concavity and which are articulated between each other two by two
to comprise two arms (3-4) and (5-6) that together constitute a deformable
parallelogram.

25

Thus, the first elementary arm (3) and the third elementary arm (5) that are coupled
together through one intermediate articulation (5') form a first composed arm (3-5)
that, through an articulation (5''), is connected to the body (8) of a head (c), while, at
the opposite part, by means of another base articulation (3') it is connected with the
30 body (1) of the nozzle (a), Figure 3.

At the same time, the second elementary arm (4) and the fourth elementary arm (6),

that are coupled together through an intermediate articulation (6') form a second composed arm (4-6) that, through an articulation (6''), is connected to the body (8') of a head (c), while at the opposite part, by means of another base articulation (4'), it is connected with the body (1) of the nozzle (a), Figure 3.

5

In the tubular head (c), the semi-nozzles (9) and (9') form an opening destined to enable the passage of the needle (2), Figures 2 and 3.

10 The header has the projections (7) and (7') as holders, while the other projections in the areas of the intermediate articulations (5') and (6') form or can form other intermediate holders.

15 To assemble the device around the needle (2) -in the manufacturing phase- the header (c) is formed by two parts that have respective nerves (10) and (10') which can be leant against each other, which have male-female coupling means that bind them, such as recesses of ones, and the others with rounded projections (10'') across them (Figures 3 to 5).

20

Likewise, from the internal part of the parallelogram, the intermediate articulations (5') and (6'') have internally projected centering fins (12) and (13) that are formed so as to define a narrow passage for the needle (2) between them (see Figures 4 and 5, and especially that sectional view of Figure 6).

25 Lastly, the protector possesses means for the positional locking of the arms, be it in the position folded towards the base (a) -Figure 3- held back in the same through a simple pressure that produces the wedging of these locking means which may comprise projections and recesses or hookings, or simply the end (1') of the body (1) in the header (c). In the passage (11), these locking means can be defined by a projection or membrane (11') which positionally fixes the folding and unfolding of (b),
30 by a forced adjustment against the lateral external parameters of the needle (2).

The head (c), as well as the arms (b) and the coupling nozzle (a), can preferably be

structured as a single piece of plastic material or similar or constituting at the end of the arms (3) and (4) articulated in (3') and (4') with a ring that adheres to the body (1) of the coupling nozzle (a). This latter embodiment, obviously, has the advantage of being able to adapt the system of the conventional needles, with no need of modifying or producing them expressly.

Each needle (2), provided with its incorporated protector (b), can be sold in a package including a security binding (p) (Figure 1), that guarantees that the system has not been previously used (Figure 1).

Having removed said binding (p), in order to use the needle (2), it is only needed to press the protector at the holders (14) and (14'), as shown in Figure 2, by which the composed arms (3-5) and (4-6), articulated in (5')-(6'), (3')-(4') and (5'')-(6''), will fold, its structure deforming the parallelogram in such a way that the arms (5) and (6) approach the arms (3) and (4), respectively (Figure 3), and, at the same time, the needle (2) projects out of the protector, enabling the needle to be employed for its normal use, and eventually being fixed in such position due to the locking means.

Once the needle (2) is used, the protector (b) is pressed again in the opposite way to the one indicated in Figure 2 (Figures 10 and 11), with which the parallelogram will close and will cover the needle (2) completely (Figures 7 and 9). To cooperate with this procedure, the structure (b) can be normally tensed in an elastic way towards the folding position.

Each feature disclosed in the specification (which term includes the claims) and/or shown in the drawings may be incorporated in the invention independently of other disclosed and/or illustrated features.

It will be understood that the present invention has been described above purely by way of example, and modifications of detail can be made within the scope of the invention.

CLAIMS

1. A protector for a needle comprising means for retaining a needle and a protective device connected to the retaining means which can be moved between a
5 stowed position and a deployed position in which it can shield the end of the needle.

2. A protector for a needle according to Claim 1, wherein the protective device comprises a deformable parallelogram.

10 3. A protector for a needle comprising a long tip protector which, surpassing the length of the needle, covers the needle completely, the needle being housed in a nozzle coupled with the spout of the syringe, wherein said tip protector comprises a deformable parallelogram of four concave arms, two pairs of said arms being articulated at one of their ends to form two composed long arms; each of these
15 composed long arms having one end coupled in an articulate way with the coupling nozzle in which the needle is housed, while, on the opposite end, the same arms articulate with a tubular terminal, said tubular terminal being disposed surpassing the sharp pointed end of the needle, and constituting an enabling passage for the folding of the arms of the deformable parallelogram against its base in the mentioned coupling
20 nozzle, said cover including temporal positional locking means for this folded disposition, and locking means for the concave arms when deployed in a covering disposition of the needle.

4. A protector for a needle according to Claim 3, wherein the elementary arms, its articulations, the tubular terminal, the locking means and the coupling nozzle to the
25 spout of the syringe constitute a single piece.

5. A protector for a needle according to any one of Claims 2 to 4, wherein the lengths of the deformable parallelogram are biased towards a deployed position.

30 6. A protector for a needle according to any one of Claims 3 to 5, wherein the locking means of the folded protector are disposed between the tubular terminal and

the area near the coupling nozzle to the syringe.

7. A protector for a needle according to any one of Claims 3 to 6, wherein the locking means of the folded protector are disposed between the confrontable borders
5 of the arms composing the deformable parallelogram.

8. A protector for a needle according to any one of Claims 3 to 7, wherein the locking means of the protector displayed covering the needle is a holder that defines the shutting of said parallelogram in the longitudinal way of the needle.
10

9. A protector for a needle according to Claim 6 or Claim 7, wherein the locking means are rounded projections and recesses that engage each other.

10. A protector for a needle according to Claim 6 or Claim 7, wherein the locking
15 means are hookings that engage each other.

11. A protector for a needle according to any one of Claims 3 to 5, wherein the locking means are constituted by an elastic means that, normally reducing the passage of the needle through the tubular terminal, constitutes a stopper of the relative
20 positional lock by forced contact against the external lateral sides of said needle.

12. A protector for a needle substantially as herein described with reference to and as illustrated in the accompanying drawings.

- 10 -

Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

Application number
GB 9510789.2

Relevant Technical Fields

- (i) UK Cl (Ed.N) A5R (RGG)
(ii) Int Cl (Ed.6) A61M 5/32

Search Examiner
MR N A FRANKLIN

Date of completion of Search
23 AUGUST 1995

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-
1-12

(ii) NONE

Categories of documents

- | | |
|--|--|
| <p>X: Document indicating lack of novelty or of inventive step.</p> <p>Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p>A: Document indicating technological background and/or state of the art.</p> | <p>P: Document published on or after the declared priority date but before the filing date of the present application.</p> <p>E: Patent document published on or after, but with priority date earlier than, the filing date of the present application</p> <p>&: Member of the same patent family; corresponding document.</p> |
|--|--|

Category	Identity of document and relevant passages		Relevant to claim(s)
X	EP 0321903 A2	(DOLGIN) see Figures 1 and 2; column 6 line 48 - column 7 line 1	1-4, 6
X	US 5151089	(KIRK ET AL) see Figures	1
X	US 4923446	(PAGE ET AL) see Figures 14A, 14B	1
X	US 4867172	(HABLEY MEDICAL TECHNOLOGY) see entire document	1-4, 6, 7, 9 10
X	US 4790828	(DOMBROWSKI & WELCH) see Figures 1-8	1-4, 6, 7
X	US 4735618	(HAGEN) see Figures 1-4, column 5, line 29 - column 6 line 30	1-7

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).